MINISTRY OF HEALTH OF UKRAINE
POLTAVA STATE MEDICAL UNIVERSITY
DEPARTMENT OF THE GENERAL SURGERY WITH PATIENT'S CARE

Surgical infections
ACUTE PURULENT DISEASES OF CELLULAR TISSUE AND ORGANS

Lecture for general surgery
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Poltava

Surgical infections is

- introduction and reproduction into **macro**organism of the pathogenic **microorganisms**, being accompanied a complex of reactive processes; comes to the end with a disease, a bacteriocarrier or death of microbes.

Classification of the surgical infections:

- **By origin:** - the extra hospital
- - the intra hospital (nosocomial)
- **On a infected source**: - the exogenous
- - the endogenic
- **On a microbial etiology**:
- a) **the nonspecific**:
- — aerobic (staphylococcal, streptococcal, collibacillary, pyocyanic etc.)
- — anaerobic (klostridialny, neklostridialny)
- — the fungic
- — the admixed
- b) **the specific** (tuberculosis, lues, actinomycosis other)

- **On features of a pathogenesis**:

— wound infectious complications

— pyoinflammatory diseases

— the infectious complications which directly didn't connected with surgical intervention on the damaging organ

- **On clinical features :**

— the purulent

— the putrefactive

- **On a clinical current**:
- — the acute
- — the chronic
- — the erased
- — the atypical
- — the latent
- **On prevalence:**
- — the local
- — progressing (invasive)
- — generalized (sepsis)

- **On localization:**

— lesions of a skin, subcutaneus fat

— lesions of a brain, its covers membranes

— lesions of internal structures of a neck

— lesions of a thoracal wall, pleural cavity, lungs, mediastinums

— lesions of an abdominal wall, peritoneum, intra abdominal organs

— lesions of organs of a pelvis

— lesions of bones and joints

PURULENT DISEASES OF CELLULAR TISSUE AND ORGANS

Classification of the surgical infections:

- 1 Acute surgical infections.
- 2 Chronic surgical infections.

1.Acute purulent surgical infections

- 1 Acute purulent aerobic infections.
- 2 Acute anaerobic infections.
- 3 Acute specific infections.
- 4 Viral infections.

Furuncle

- Acute suppurative infection within one hair-follicle and surrounding tissue
- Pathology: acute suppurative inflammation
- congestion and exudation of components of blood

Furunculosis: infection of several hair follicles in a circumscribed area.

Furunculoisis

Carbuncle

- A confluent infection involving multiple contiguous follicles in which the infection is limited to the subcutaneous tissue by thick overlying skin and dense subcutaneous fascia.

- Carbuncles require incision for drainage and treatment.

Carbuncle


http://dermis.net

Cellulites

- acute infection of loosing connective tissue.
- Pathogens: *B-hemolytic Streptococci* or *Staphylococci aureus*
- Clinical presentation: redness of skin, swilling and boundless
- Anaerobic cellulites: crepitation
- Treatment: antibiotics

  incision and draninage

Erysipelas

Erysipelas is a type of skin infection (cellulitis).

Skin wound → local inflammation → lymphadenitis → systemic inflammation

Redness of skin with clear boundary

Edema of proximal lymphanode

Systemic sepsis

Symptoms of erysipelas

- Blisters
- Fever, shaking, and chills
- Painful, very red, swollen, and warm skin underneath the sore (lesion)
- Skin lesion with a **raised border**
- Sores (erysipelas lesions) on the cheeks and bridge of the nose

raised border

Treatment of erysipelas

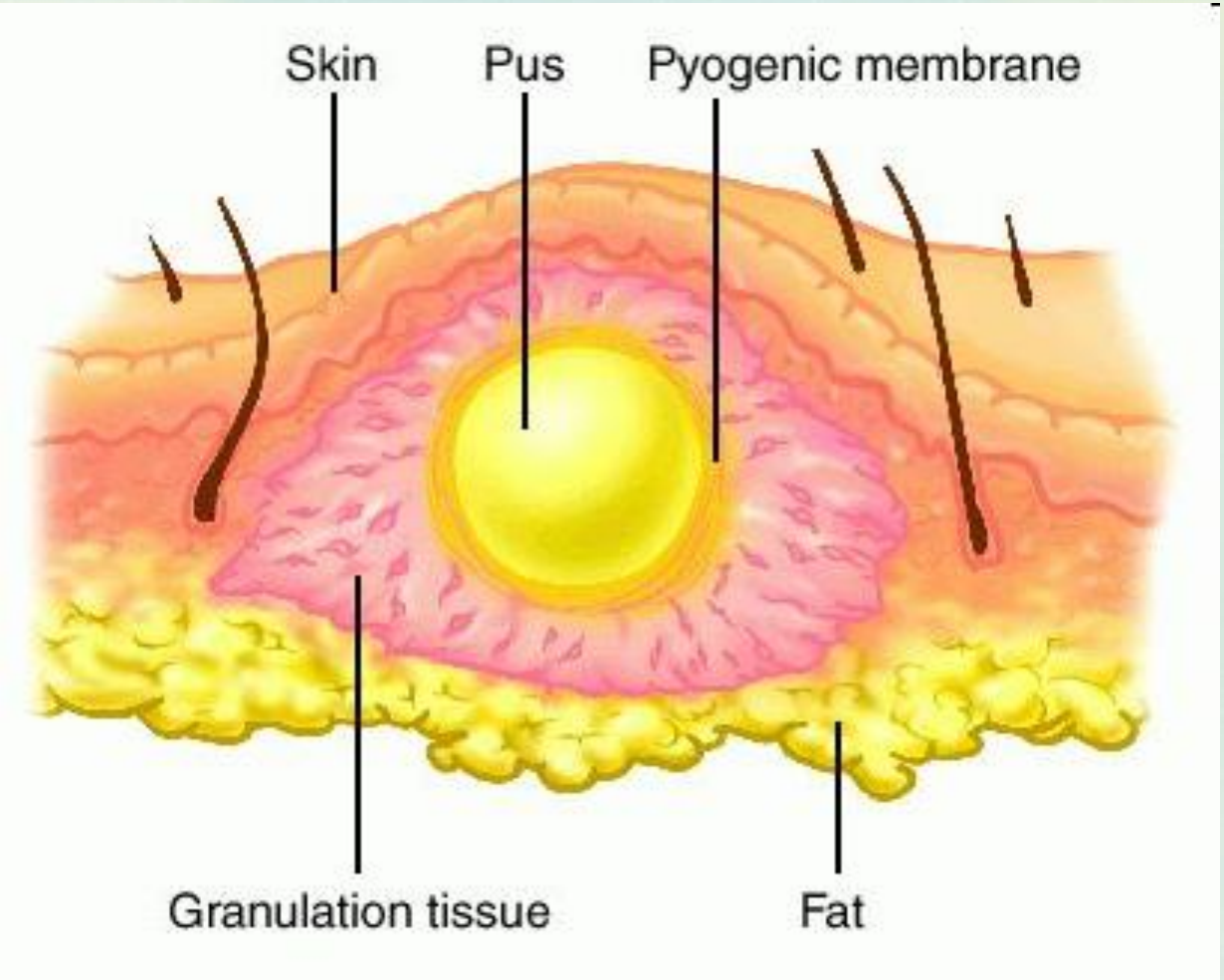
- Elevation and rest of the affected limb are recommended in erysipelas treatment to reduce local swelling, inflammation, and pain.
- Saline wet dressings should be applied to ulcerated and necrotic lesions and changed every 2-12 hours, depending on the severity of the infection.
- Streptococci cause most cases of erysipelas; thus, penicillin group has remained first-line therapy. Penicillin group administered orally or intramuscularly is sufficient for most cases of classic erysipelas and should be given for 10-20 days.
- A first-generation cephalosporin or macrolide, such as erythromycin or azithromycin, may be used if the patient has an allergy to penicillin. Cephalosporins may cross-react with penicillin and should be used with caution in patients with a history of severe penicillin allergy such as anaphylaxis.

- Hospitalization for close monitoring and intravenous antibiotics is recommended in severe cases and in infants, elderly patients, and patients who are immunocompromised.
- Coverage for Staphylococcus aureus is not usually necessary for typical infections, but it should be considered in patients who do not improve with penicillin or who present with atypical forms of erysipelas, including bullous erysipelas. Some authors believe that facial erysipelas should be treated empirically with a penicillinase-resistant antibiotic, such as dicloxacillin or nafcillin, to cover possible S aureus infection, but supporting evidence for this recommendation is lacking.[6]
- Patients with recurrent erysipelas should be educated regarding local antisepsis and general wound care. Predisposing lower extremity skin lesions (eg, tinea pedis, toe web intertrigo, stasis ulcers, asteatotic dermatitis) should be treated aggressively to prevent superinfection. Use of compression stockings should be encouraged for as long as 1 month in previously healthy patients and long term in patients with lower extremity edema. Long-term management of lymphedema is essential. Long-term prophylactic antibiotic therapy generally is accepted, but no true guidelines are available. Treatment regimens should be tailored to the patient.

Abscess

- Characterized by a necrotic center without a blood supply and composed of debris from local tissues, dead and dying leukocytes, components of blood and plasma and bacteria
- This semiliquid central portion (Pus) is surrounded by a vascularized zone of inflammatory tissue.

Abscess - is a localized collection of pus in a cavity formed by disintegration of tissues.



Cross section of abscess.

Hydradenitis suppurativa

- Infection of apocrine sweat glands
- axilla, groin, perineum, any skin fold
- Single abscess treated by I&D
- Doxycycline 100mg BID
- Excision with STSG (15%)

Hidradenitis suppurativa: In its earliest stage, HS often looks like boils or pimples (left), but with time thick scars can form (right)

Phlegmon

Phlegmon - is acute diffuse purulent inflammation of fatty tissue & fatty spaces .

P. may be:

l)superficial & deep;

2) purulent, purulent-hemorrhagic, putrefactive.

Clinical Fig. is severe, characterized by rapid appearance & spreading painful swening, diffuse redness of skin, pains, expressed disorder of function of affected part of the body, high temperature (~40 C). Later fluctuation & softening appear in the center of phlegmon.

- The course of phlegmon is bad usually : pus is spread throught fatty interspaces with the involvement of new parts of the body in the process.
- **Treatment** is carried out in hospitals only. Opening of phlegmon is obligatory but the great importance possesses to general conservative treatment, especially to antibiotics.

Treatment purulent formation is

Incision and drainage

- Antibiotics
- Antypain drags
- Preparation of wound according phase of wound process

MASTITIS

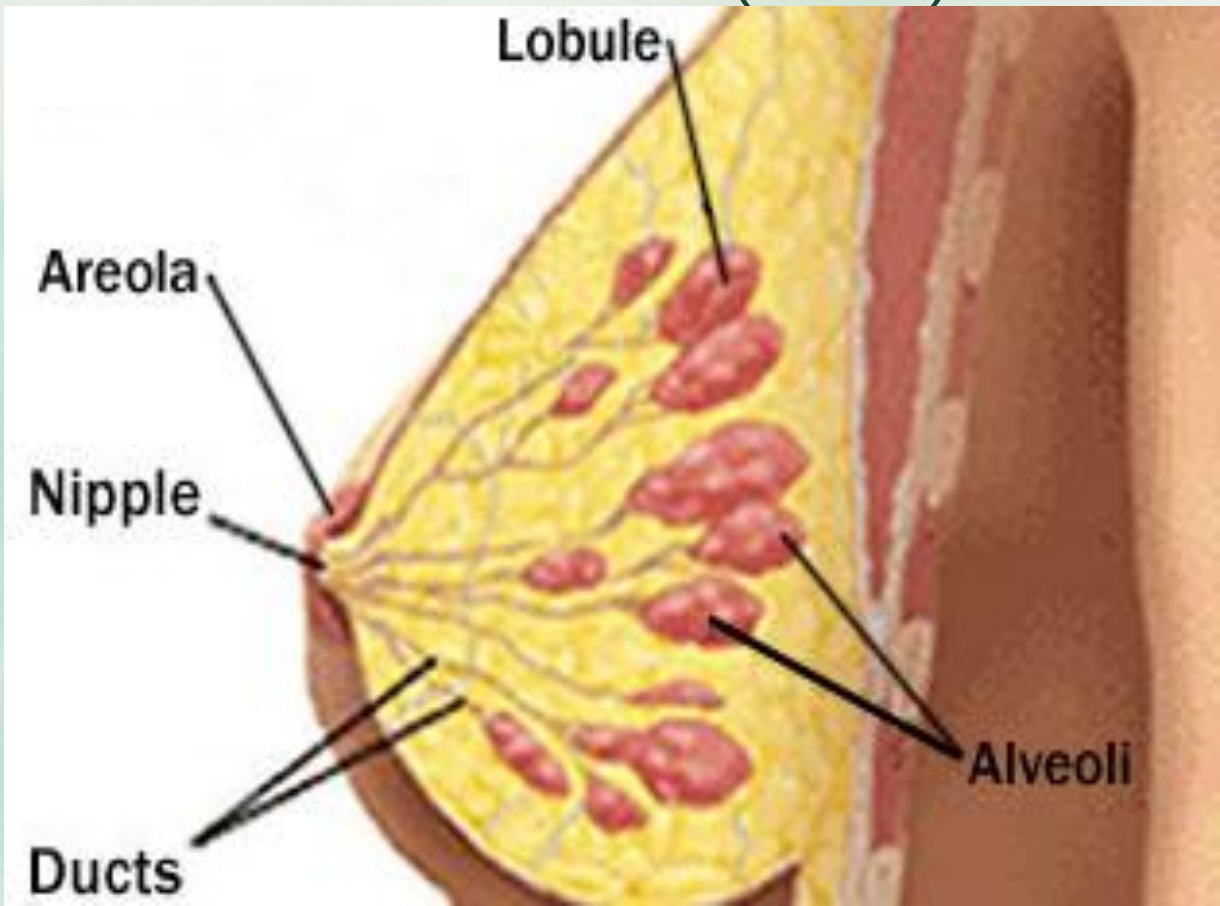
Female breast anatomy

- The structure of the female breast is complex — including fat and connective tissue, as well as lobes, lobules, ducts and lymph nodes.

Lobules and ducts

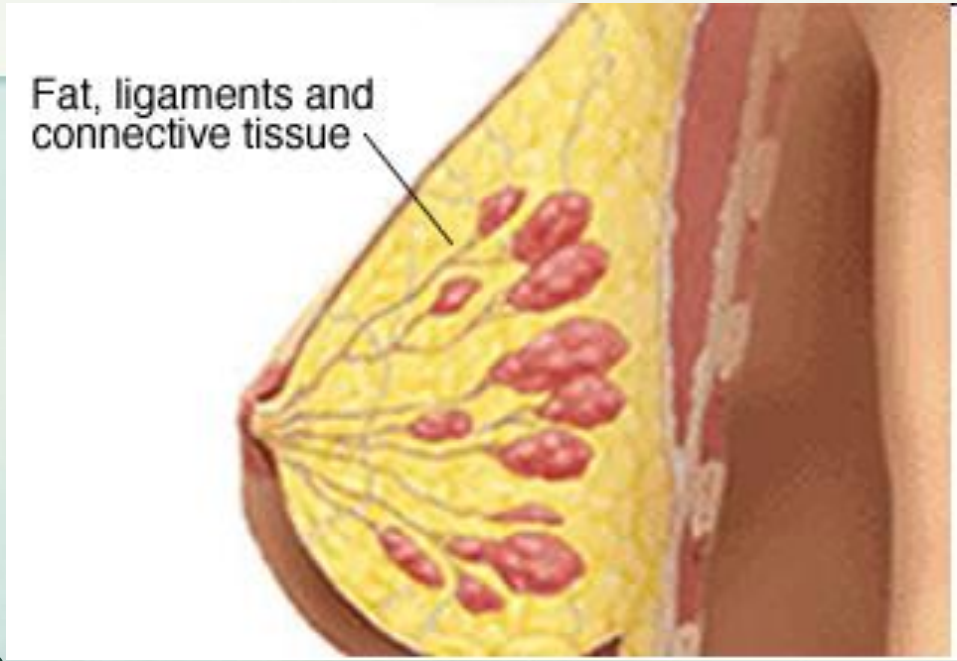
Each breast has a number of sections (lobules) that branch out from the nipple. Each lobule holds tiny, hollow sacs (alveoli). The lobules are linked by a network of thin tubes (ducts). If you're breast-feeding, ducts carry milk from the alveoli toward the dark area of skin in the center of the breast (areola).

From the areola, the ducts join together into larger ducts ending at the nipple.



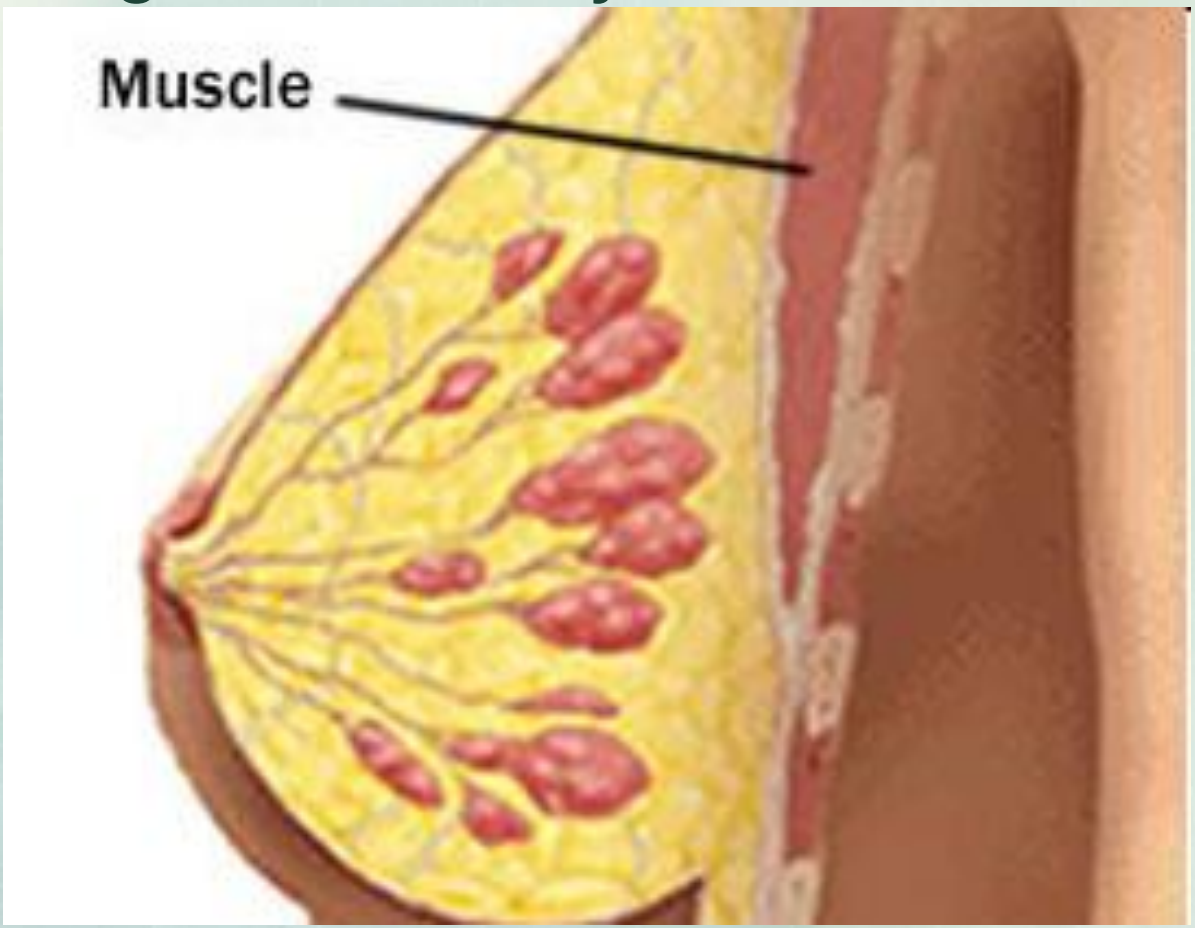
Fat, ligaments and connective tissue

Spaces around the lobules and ducts are filled with fat, ligaments and connective tissue. The amount of fat in your breasts largely determines their size. The actual milk-producing structures are nearly the same in all women. Female breast tissue is also sensitive to cyclic changes in hormone levels. Younger women might have denser and less fatty breast tissue than do older women who've gone through menopause.



Muscles

- The breast has no muscle tissue. Muscles lie underneath the breasts, however, separating them from your ribs.



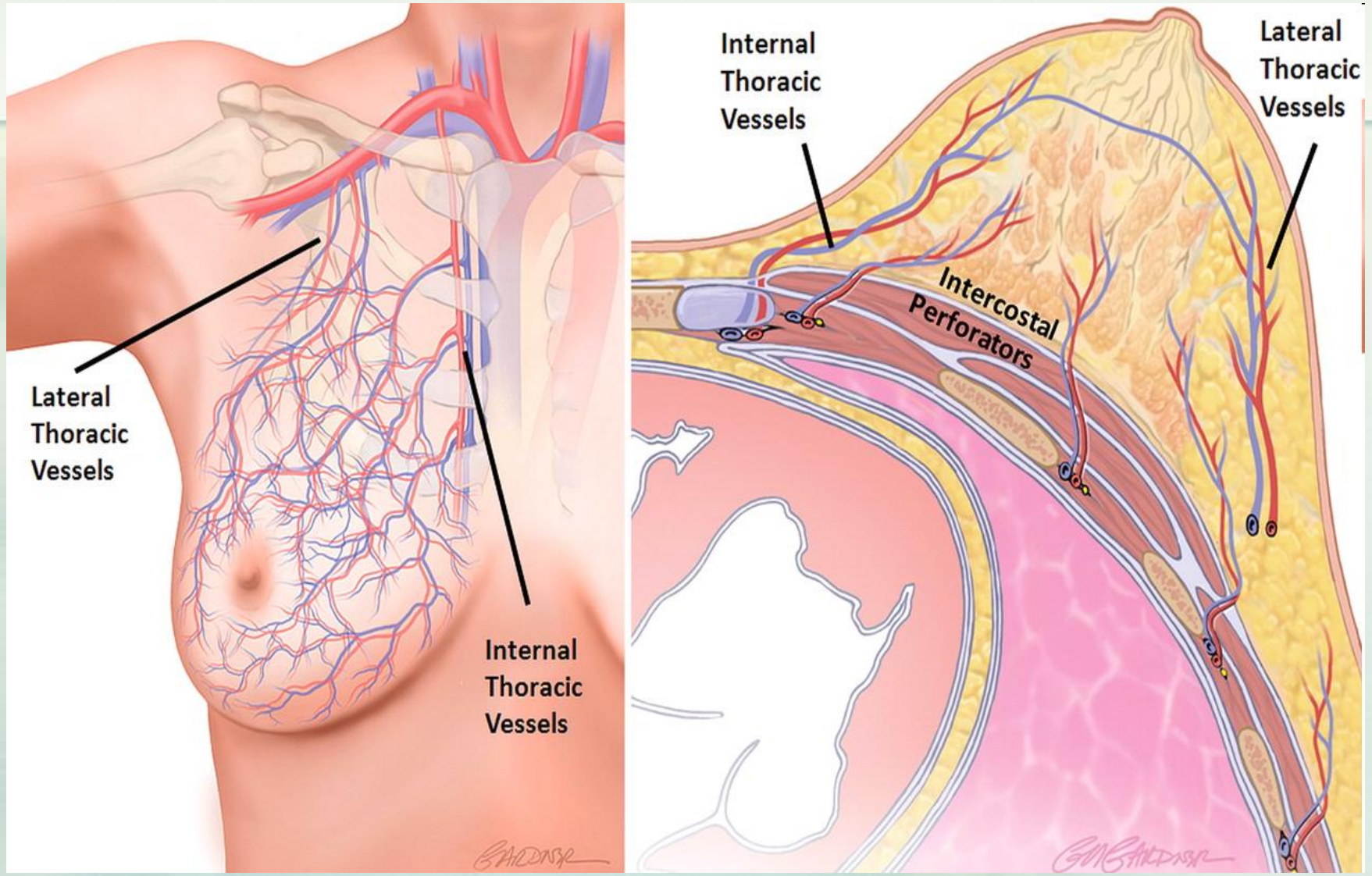
Blood supply

arterial branches of

- a. thoracica interna,
- a. thoracica lateralis
- aa. intercostales.

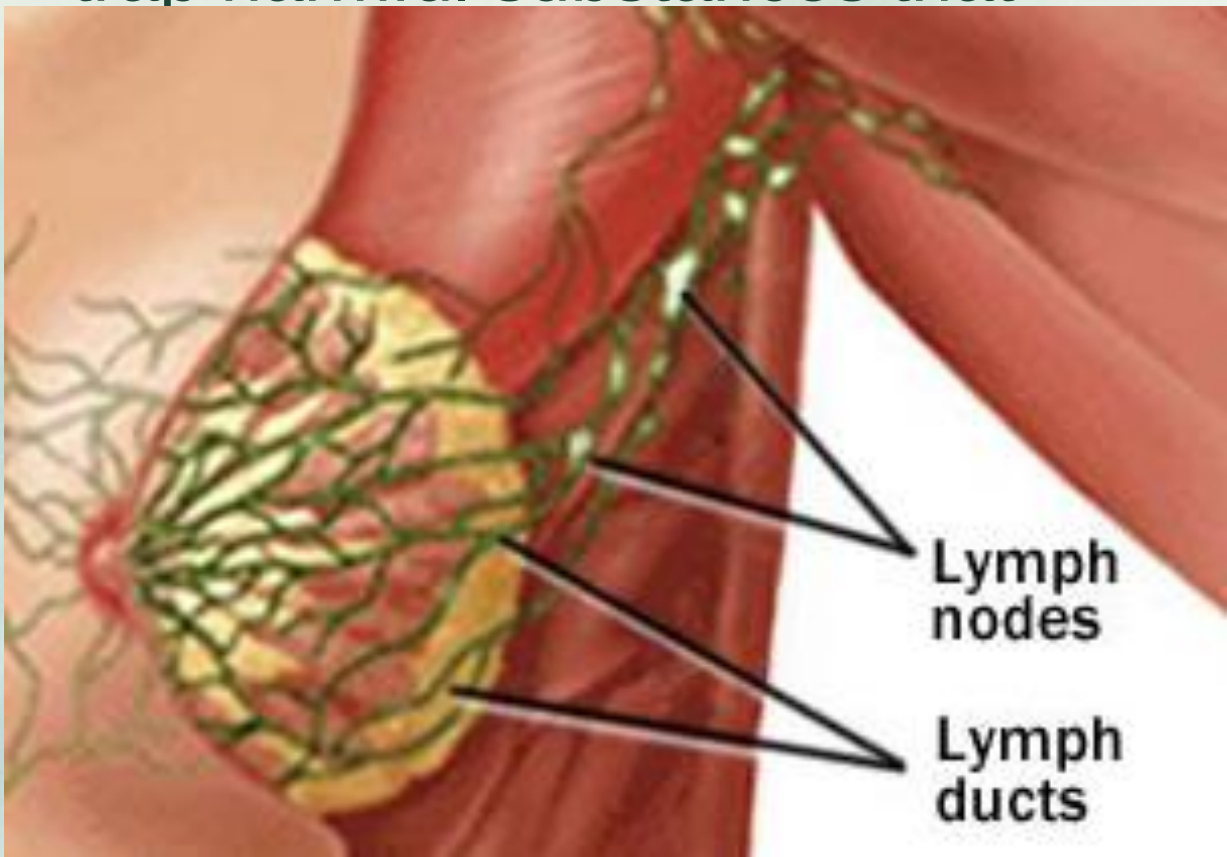
Deep veins are accompanied by of the same name arteries


Торакоакромиальная артерия
Подмышечная артерия
Передние перфоранты внутренней грудной артерии
Наружная грудная артерия
Задняя межкостная артерия

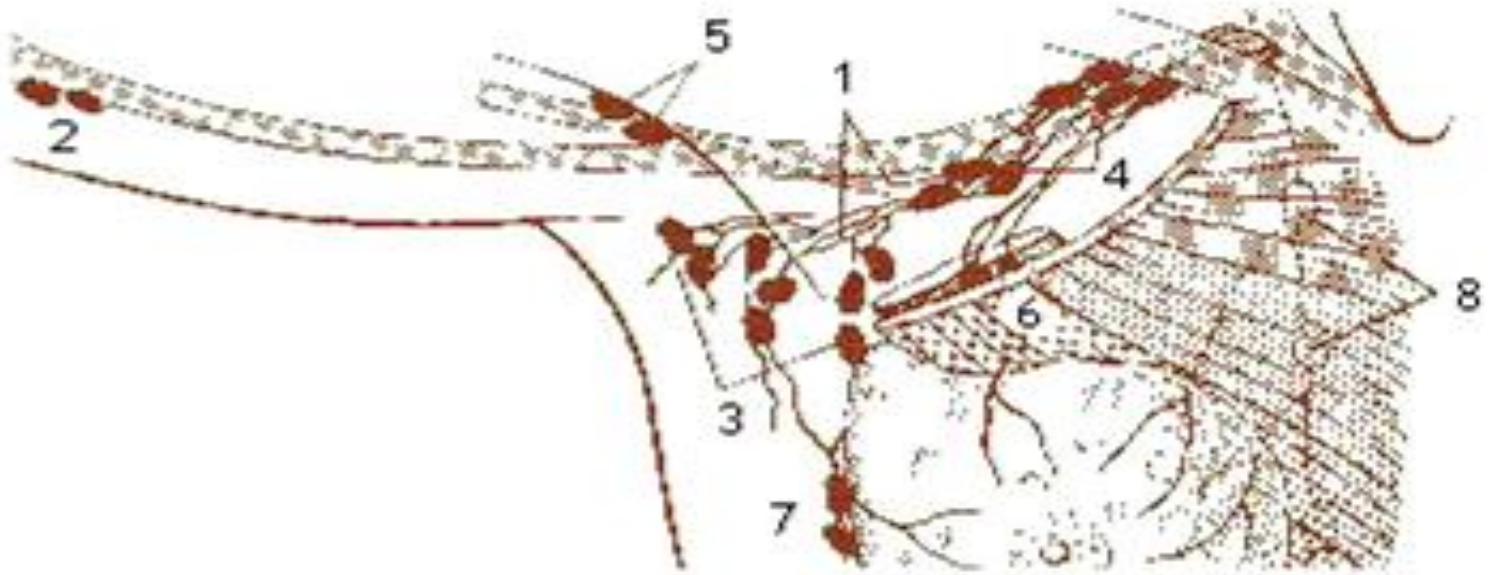

Lateral
Thoracic
Vessels
Internal
Thoracic
Vessels
Internal
Thoracic
Vessels
Lateral
Thoracic
Vessels
Intercostal
Perforators

Lymph nodes and lymph ducts

The lymphatic system is a network of lymph nodes and lymph ducts that helps fight infection. Lymph nodes — found under the armpit, above the collarbone, behind the breastbone and in other parts of the body — trap harmful substances that may be in the lymphatic system and safely drain them from the body



Regional lymph nodes of the brest



1. Axillary lymphatic plexus
2. Cubital lymph nodes
3. Superficial axillary
4. Deep axillary lymph nodes
5. Brachial axillary lymph nodes
6. Interpectoral axillary lymph nodes
7. Paramammary or intramammary lymph nodes
8. Parasternal lymph nodes (internal mammary nodes)

Mastitis

- Mastitis is the inflammation of breast tissue.

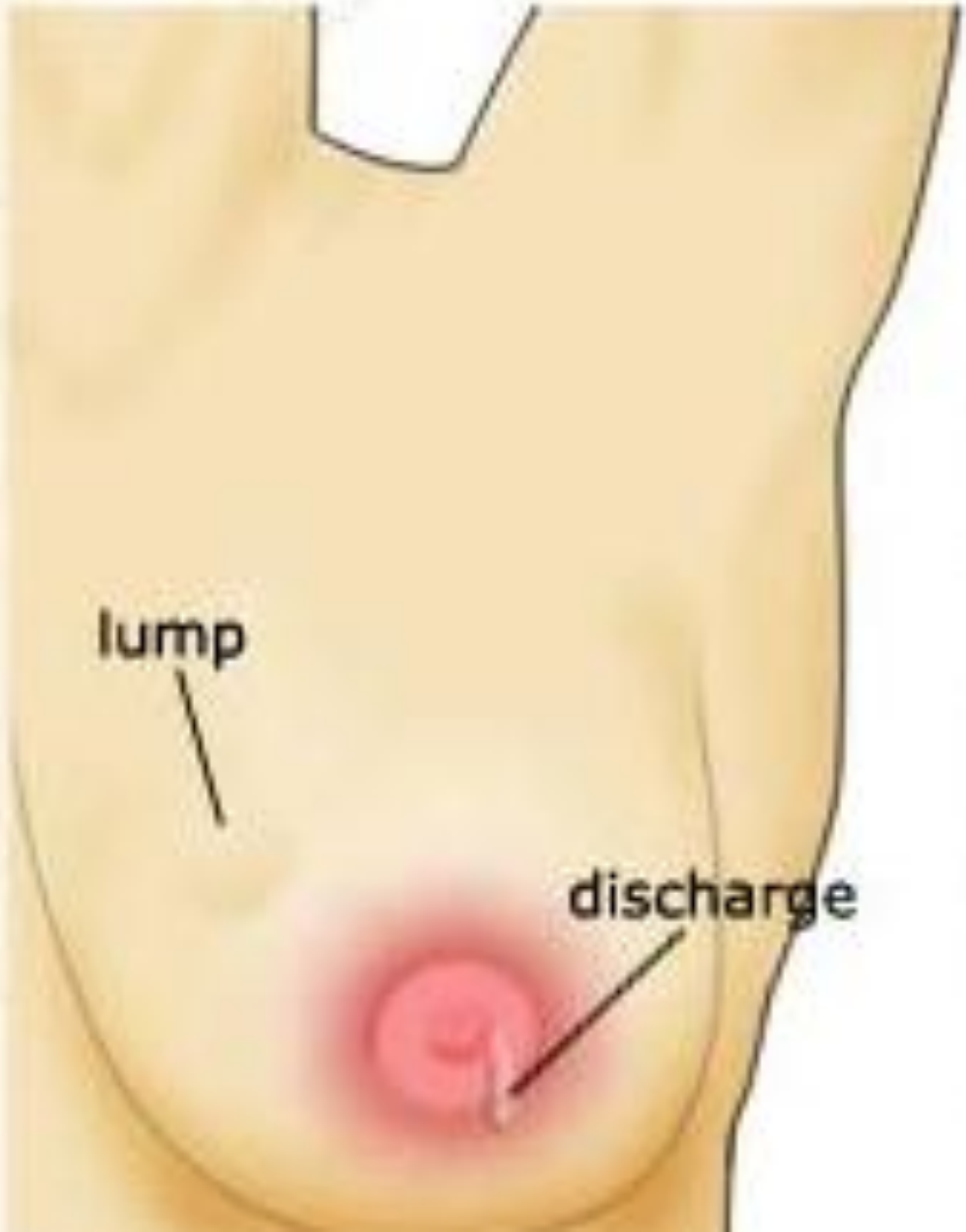
etiologi

- S. aureus is the most common etiological organism responsible, but S. epidermidis and streptococci are occasionally isolated as well.

Classification of mastitis.

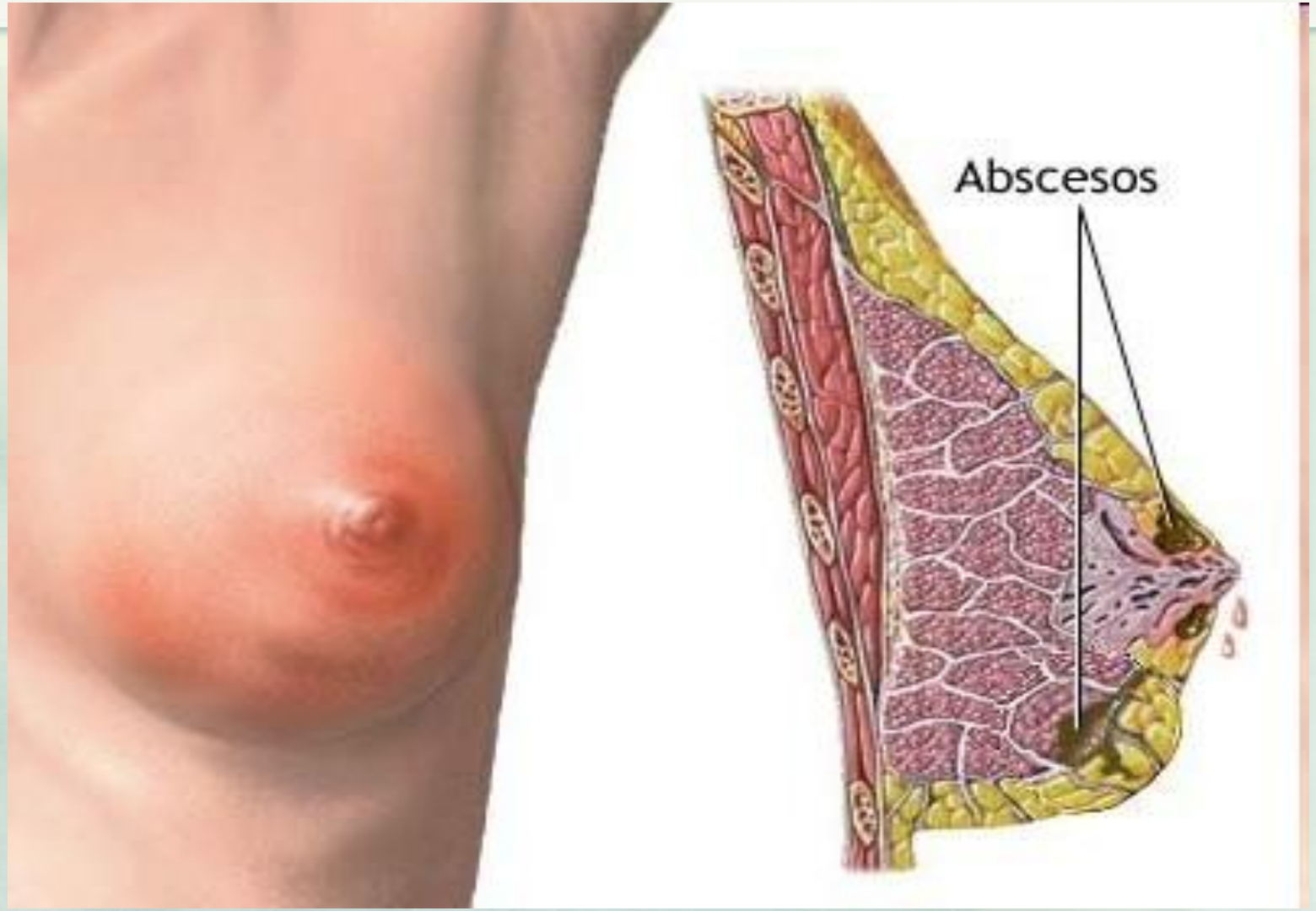
- Edematous (serous) form.
- Infiltrative form.
- Suppurative-destructive forms:
  - breast abscess;
  - phlegmonous mastitis;
  - gangrenous mastitis.

Symptoms of Mastitis



The main symptoms of mastitis are: breast pain, swelling, redness, fever, enlargement, changed nipple sensation, discharge, itching, tenderness, and/or a breast lump.

breast abscess

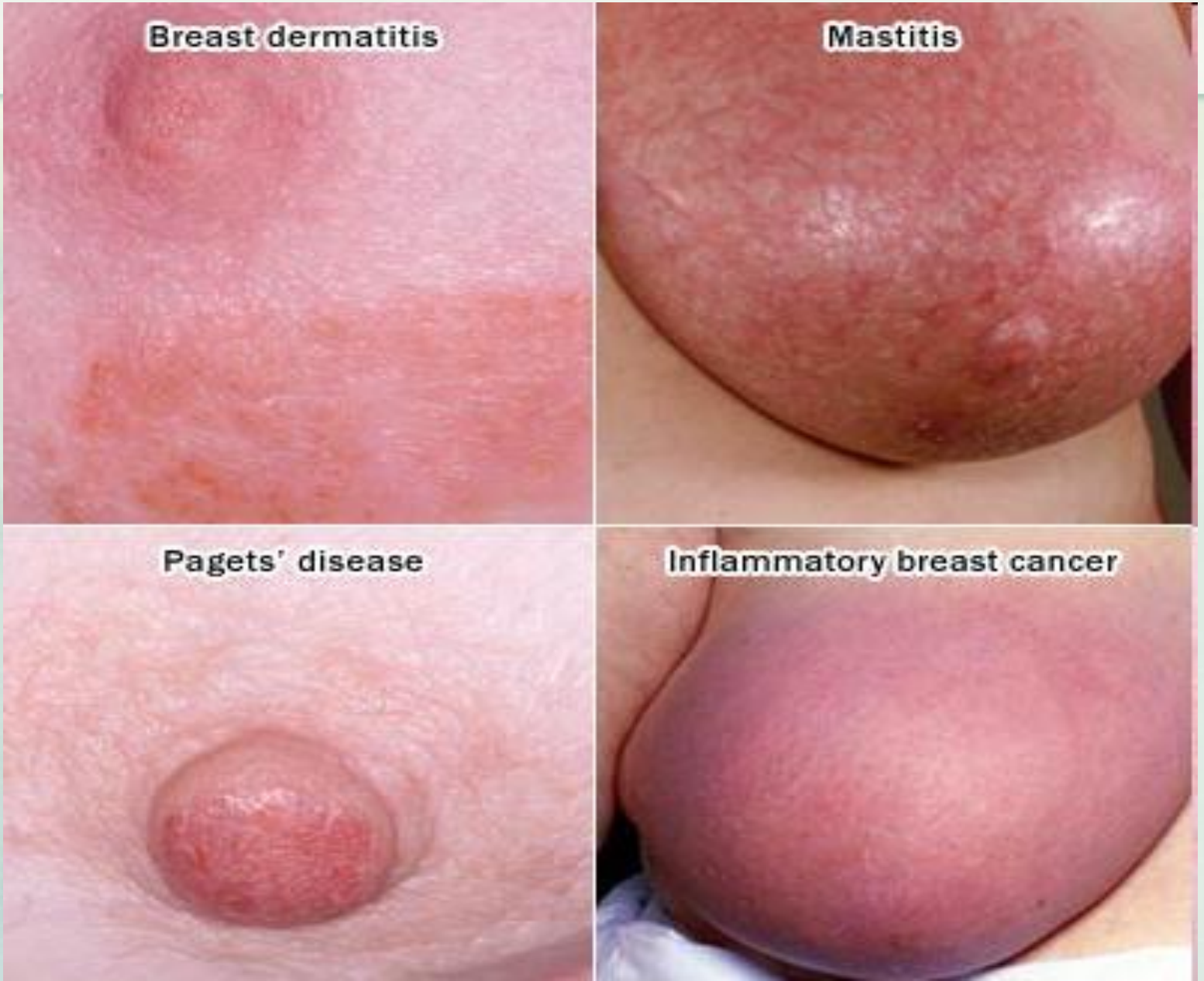


Mastitis of newborns

Mastitis in men

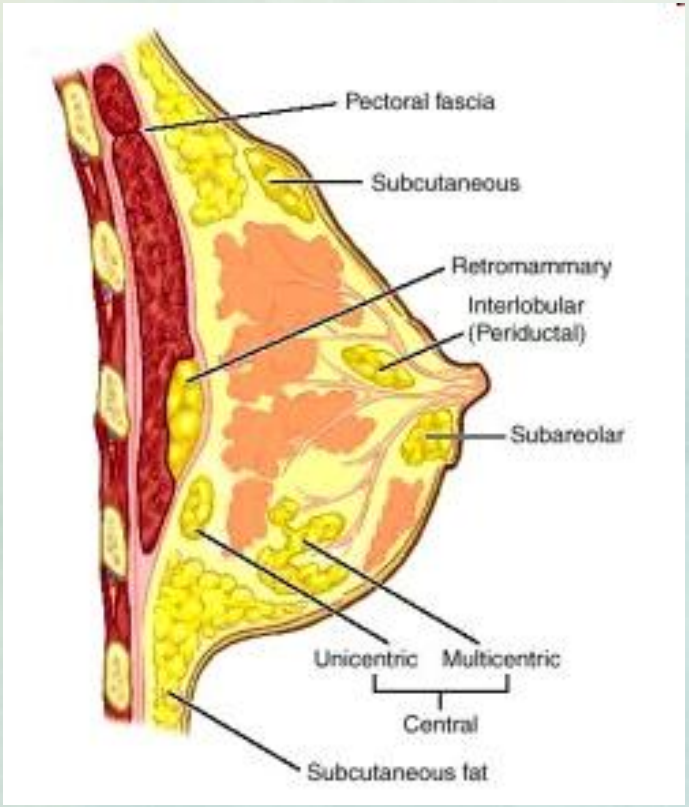
This is after a nipple piercing got infected:

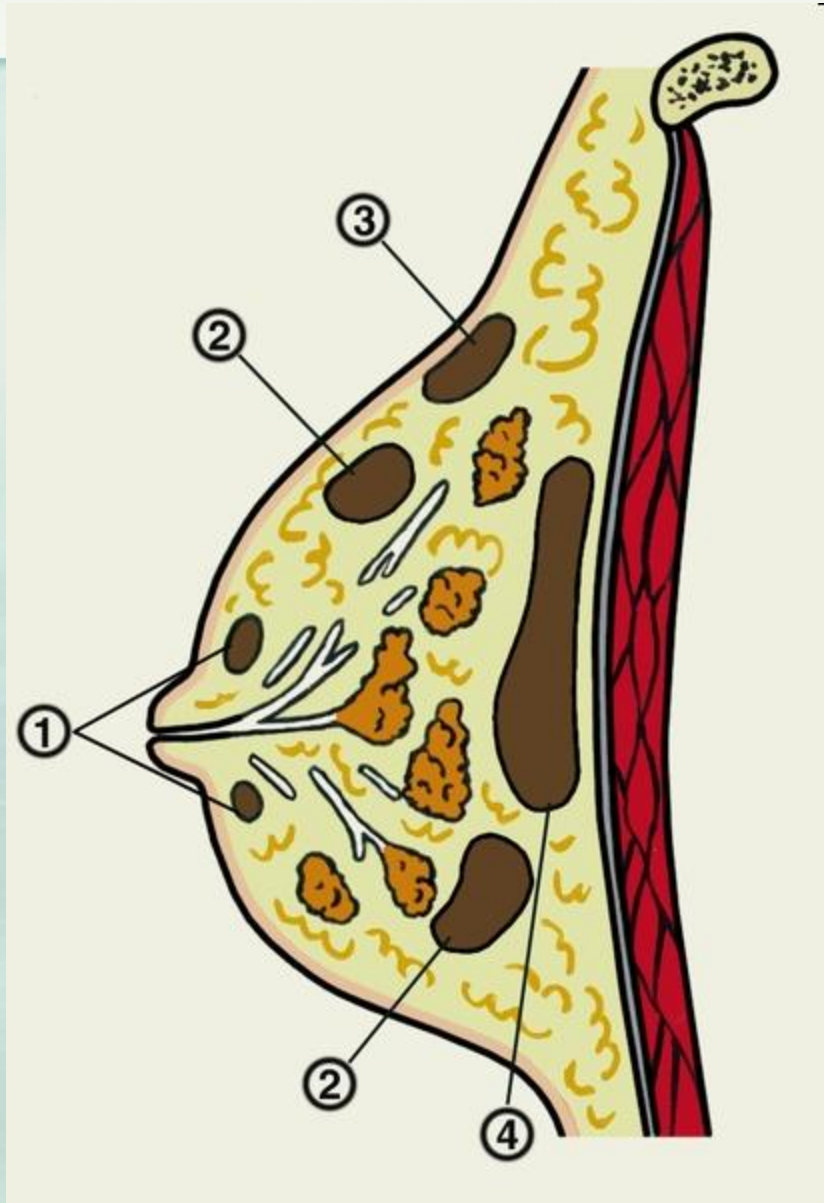
Differential diagnosis



Localisation of mastitis

- 1 — subareolaric
- 2 — intramamaric
- 3 — subcutaneus
- 4 — retromamaric



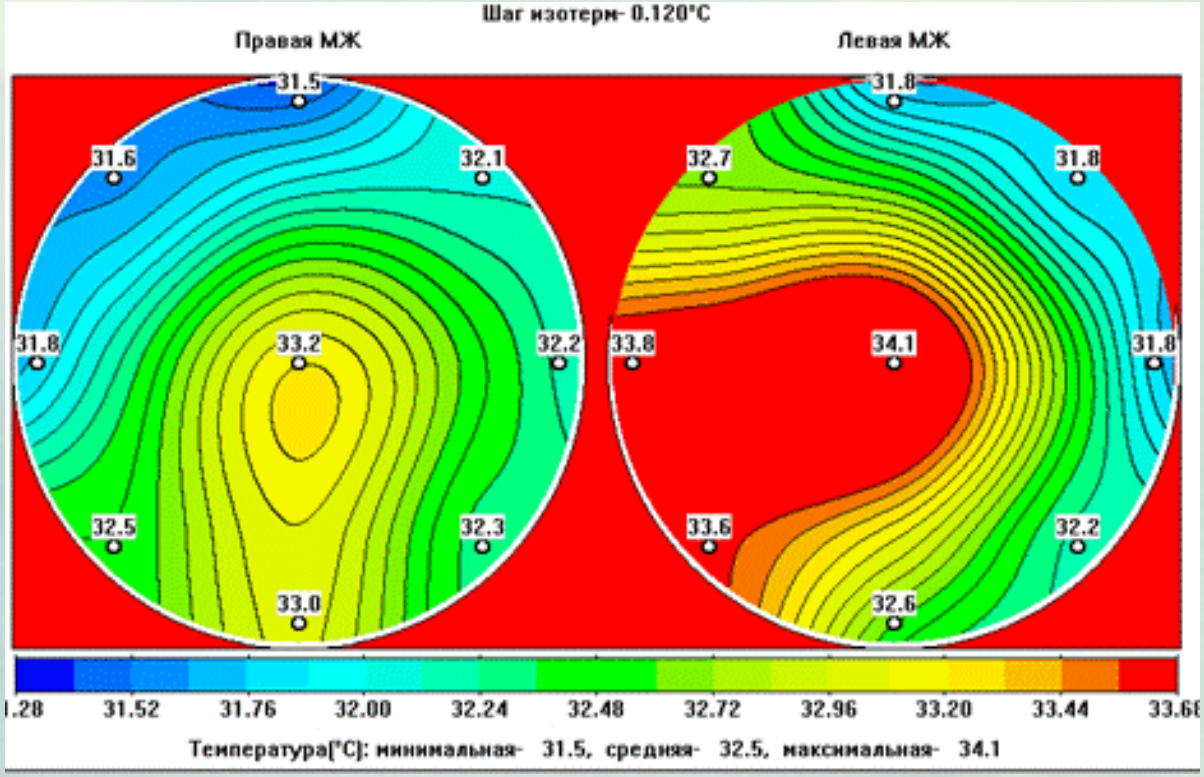


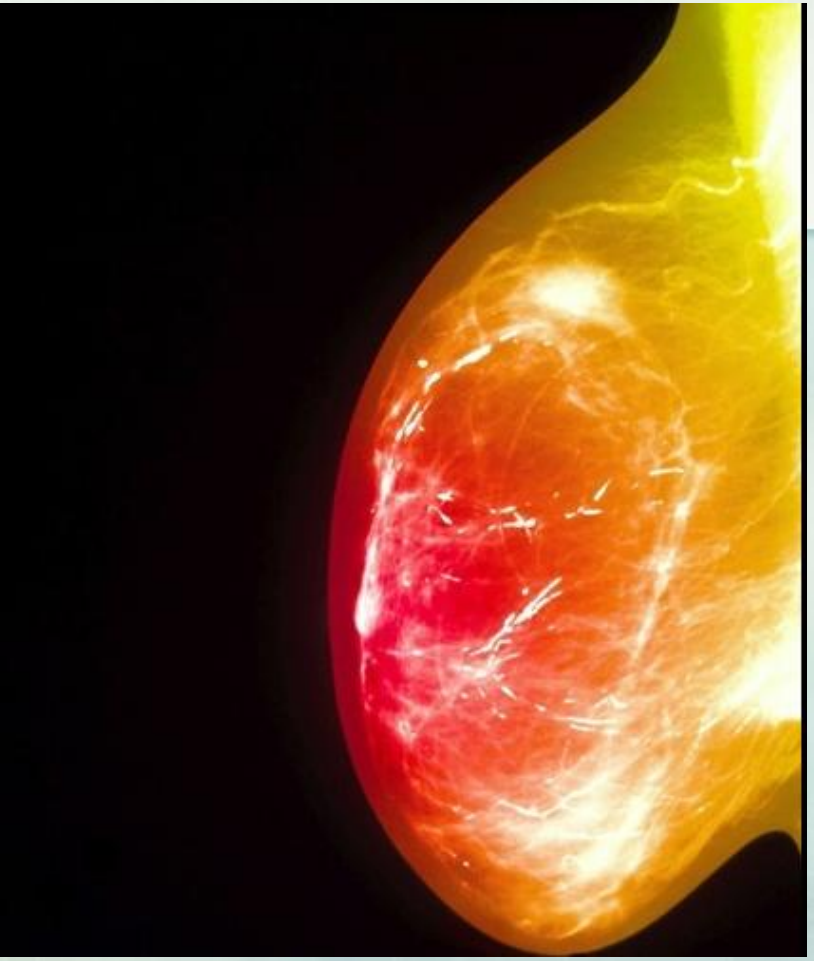
Diagnostic of mastitis

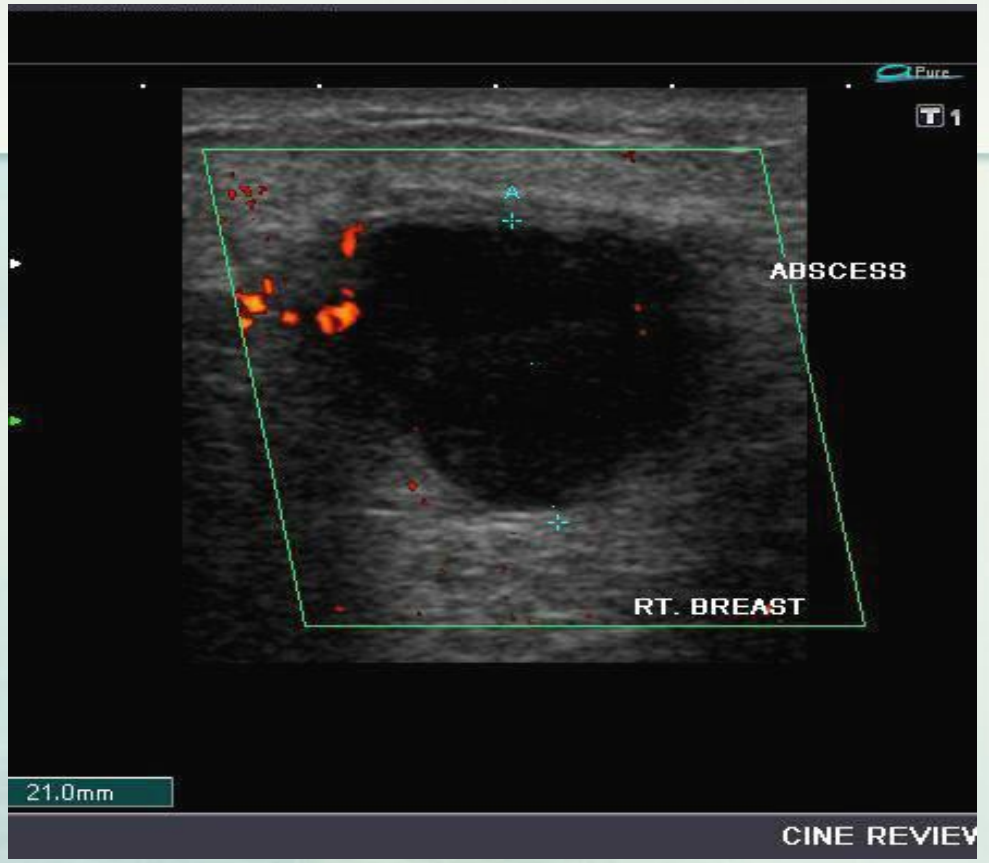
- Physical examination
- General blood tests
- Bacteriological investigation of milk
- Ultrasound investigation
- Mammograms
- Thermography
- breast biopsies

diagnostic

- Thermography







Mammography

US-diagnostics

Treatment

Main principles of therapy of a beginning (serous) mastitis

- The major component of complex therapy of milk fevers is complex application of antibiotics.
- Before the beginning of antibacterial therapy effect sowing of milk from the struck and healthy mammary glands on flora.
- Now the golden staphilococcus finds the greatest sensitivity to semisynthetic Penicillinums (Methicillinum, Oxacillinum, a dicloxacillin), to a lincomycin to Fusidinum and aminoglycosides (gentamycin, Kanamycinum). At conservation of thoracal feeding the choice of antibiotics is bound to possibility of their unfavorable influence on the newborn.

Treatment cont..

- At initial stages of a milk fever antibiotics, as a rule, introduce intramusculary.
- At use of semisynthetic Penicillinums course of treatment is continued by 7-10 days.
- Besides antibacterial therapy, the important place in treatment of beginning mastites belongs to the actions referred on reduction **lactostasis in** struck gland. - Parlodelum prescribed inside on 2,5 mg of 2 times a day within 3 days is most effective in this respect.
- A highly effective component of complex treatment of a beginning mastitis is application of physical factors of influence.
- At the expressed phenomena of an intoxication infusional therapy is shown. At average mass of a body sick (60-70 kg) within days intravenously introduce 2000-2500 ml of fluid.

Main principles of therapy of a purulent mastitis

- Treatment of patients with purulent forms of milk fevers spend in specialised surgical hospitals or units for, at conservation of a principle of integrated approach, **the surgical method becomes** the basic method of treatment. Timely dissecting of an abscess prevents diffusion of process and its generalisation. In parallel with a surgical intervention continue the complex therapy which intensity depends on the clinical form of a mastitis, character of an infection contamination and condition of the patient.
- Extremely big attention at treatment of patients with milk fevers the questions, concerning possibilities of thoracal feeding and necessity **of depressing of a lactemia deserve.**

- High virulence and polyresistance to antibiotics, characteristic for an infection contamination causing development of mastites in modern conditions, force to answer unequivocally a question on applying of the newborn to a breast. At any form of a mastitis in interests of the child thoracal feeding should be stopped. In modern obstetrics as the indication for lactemia depressing at mastites serve:
- Promptly progressing process, despite a spent intensive care
- A multifocal infiltrative-purulent and abscessing mastitis
- Phlegmonous and gangrenous forms of mastites
- Any form of a mastitis at relapsing flow
- Torpently current mastitis which is not giving in to complex therapy, including surgical dissecting of the locus

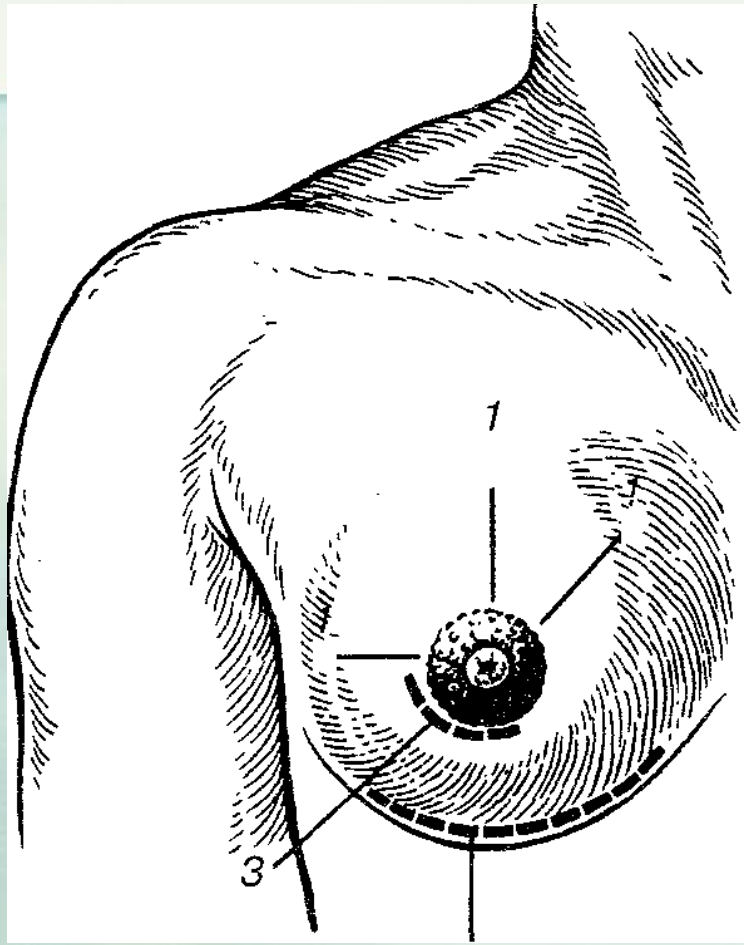
Incisions for the purulent mastitis

- 1-2 radialis
- Bardenheur's

(incision)

Incisions made in suppurative mastitis

- 1 - radial;
- 2 - Bardenheur's (incision);
- 3 - para-areolaris



Breast tissue biopsy

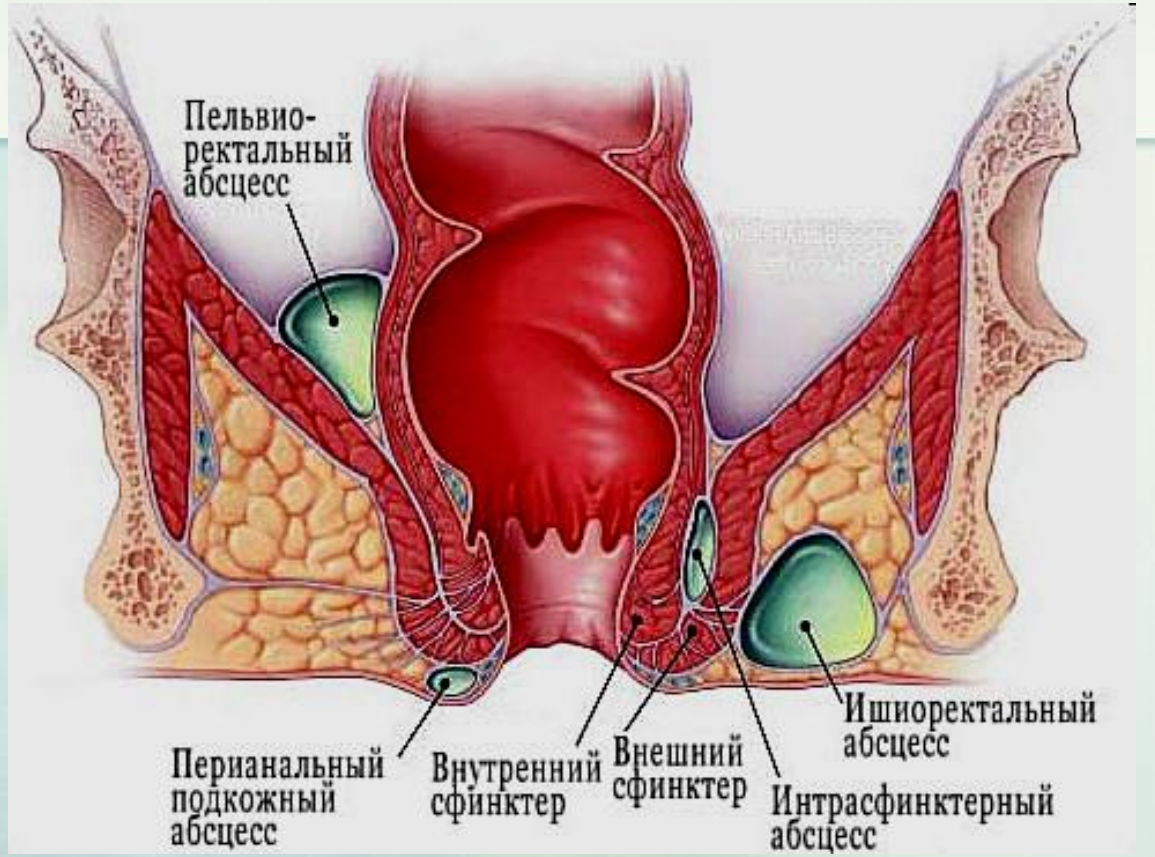
Paraproctitis

- Paraproctitis is a purulent inflammation of the cellular tissues surrounding the rectum.

- The most frequent **cause is** penetration of bacterial flora from the rectum into the surrounding cellular tissues, which may occur through an anal fissure. The inflammation is sometimes limited to the formation of an abscess, and in some cases it spreads for a considerable distance and may be complicated by sepsis.
- **The symptoms** are acute pain in the rectal region, tenderness during defecation, elevated body temperature, and the appearance of an infiltrate in the anal region or on the buttocks.
- An unlanced abscess may burst and a fistula form. The disease becomes chronic after recurrences.

Localisation

- Subcutaneus
- Intrasfincteric
- Ishiorectalis
- pelviorectalis



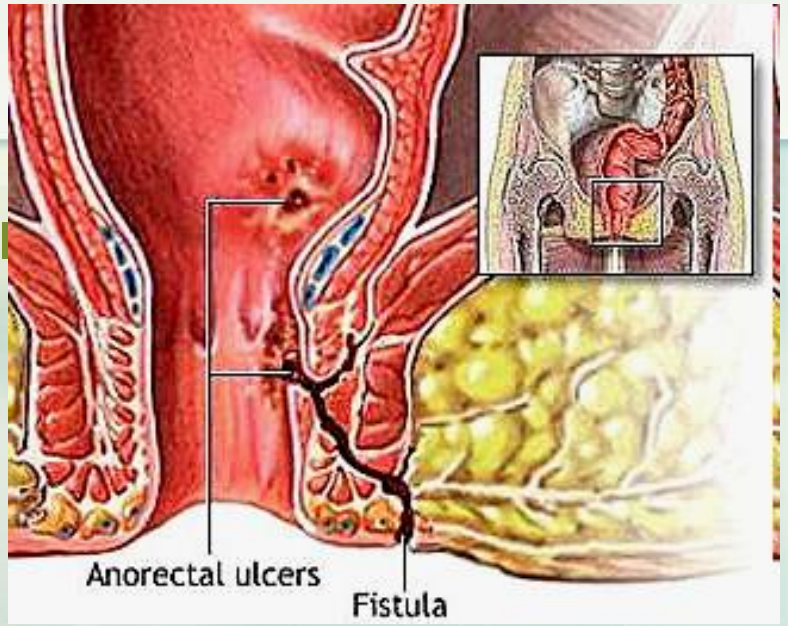
Diagnostic of colon and rectal diseases

- **Digital examination of rectum.** This examination permits to identify pathological formations (tumors, polyps, fistulas, hemorrhoids ecc.), there mobility, elasticity, painfulness, presents of blood or mucus in rectum.
- **Anoscopy** is method, which permits to inspect 15cm of rectal surface. It can by carried out by rectal speculum or by anoscop.
- **Rigid proctosigmoidoscopy** is endoscopic method of examination of rectum and distal part of sigmoid colon, similar to anoscopy.
- **Colonoscopy** (fibro-colonoscopy (FCS), video-colonoscopy) is a «gold» standard of colon and rectal examination.
- **Endorectal ultrasound examination**
- **Barium enema is X-ray examination** of colon and rectum, which permits to identify localization of lesion

Treatment paraproctitis

- In all forms of paraproctitis require urgent opening the abscess with good drainage of purulent cavities.
- In the first 2 days after the operation the patient provide only the liquid, and from 3 days, prescribed diet, poor slag.
- Conduct a course of treatment paraproctitis antibiotics and anti-inflammatory agents.

Chronic paraproctitis



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